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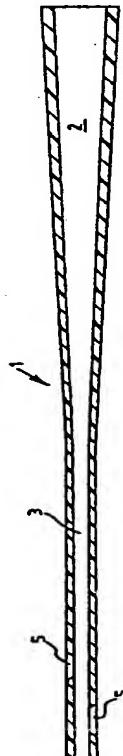
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## (54) One-piece catheter formed in a single step

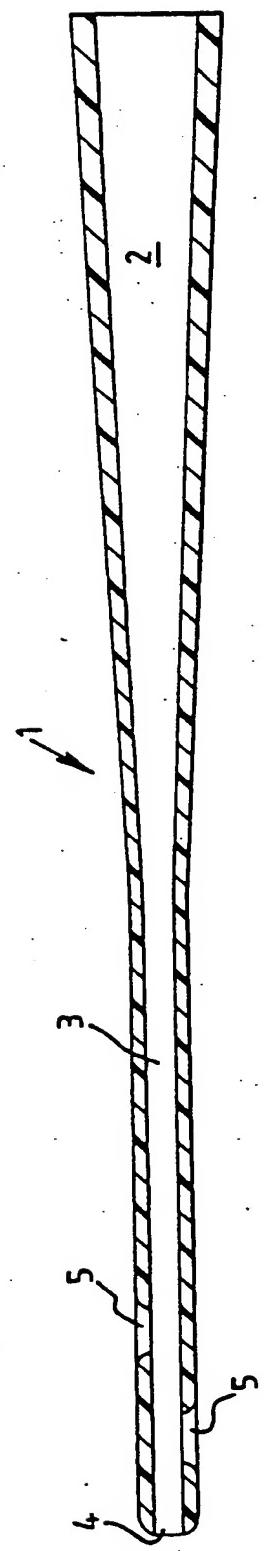
(57) An intermittent urethral catheter 1 is formed in one piece in a single moulding step from plasticised medical grade PVC or the equivalent.

The catheter 1 has a tapered cylindrical portion or funnel part 2 leading to a cylindrical tubular portion 3 which terminates in an open distal end or tip 4, there being adjacent the tip 4 two through holes or eyes 5 which are spaced apart longitudinally of the catheter 1. The holes or eyes 5 are diametrically opposite another to stabilize a rod or mandrel used in the moulding step to define the catheter 1.



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A CATHETER

The invention relates to a catheter, particularly an intermittent catheter for draining urine from the bladder via the urethea.

Existing catheters of this kind are generally made in two parts, comprising an extruded plastic tube, and funnel component. A finishing process has then to be carried out to form a blunt end or tip opposite the funnel component. A further process has to be performed to provide fluid inlet orifices or "eyes" adjacent the blunt end or tip. The overall forming operation is time-consuming and expensive and moreover does not always result in a required degree of finish at the tip and eyes.

It is accordingly an object of the invention to seek to mitigate these disadvantages.

According to one aspect of the invention there is provided a catheter, integrally formed in one piece in a single forming step.

The forming step may comprise injection moulding.

The one piece may comprise a tapered tubular portion leading to a cylindrical tubular portion bearing a tip.

The cylindrical tubular portion may have a plurality of through holes in the wall thereof on opposite diametral sides of the portion.

The respective holes on opposite diametral sides of the portion may be longitudinally offset.

The tip may be open or closed.

In an alternative there may be no through holes, and the tip may be open and may have portions of different diameter, preferably by being castellated or stepped.

5 The wall thickness of the tapered tubular portion may be greater than the wall thickness of the cylindrical tubular portion.

The wall thickness of the catheter adjacent the tip may be greater than the wall thickness of the cylindrical tubular portion and less than the wall thickness of the tapered portion.

10 According to a second aspect, the invention provides a urine drainage system including a catheter as hereinbefore defined, by way of example, with reference to the accompanying drawing which shows a schematic cylindrical sectional view of an intermittent urethral catheter according to the invention.

15 Referring to the drawing there is shown an intermittent urethral catheter 1 formed in one piece in a single moulding step from plasticised medical grade PVC or the equivalent.

The catheter 1 has a tapered cylindrical portion or funnel part 2 leading to a cylindrical tubular portion 3 which terminates in an 20 open distal end or tip 4, there being adjacent the tip 4 two through holes or eyes 5 which are spaced apart longitudinally of the catheter 1. The holes or eyes 5 are diametrically opposite another to stabilize a rod or mandrel used in the moulding step to define the catheter 1.

25 The wall thickness of the tapered portion 2 is 2mm, the cylindrical tubular portion 3 has a wall thickness of 1mm and the tip 4 has a wall thickness of 1.25mm, the holes or eyes 5 being elongate with rounded ends, 4mm x 2mm in dimension. The overall length of the

catheter 1 is 130mm, the length of the tapered portion 2 being 75mm and the cylindrical portion 3 55mm, the outside diameter of the cylindrical portion 3 being 4.5mm.

The injection moulding process provides a standardized unitary 5 catheter of one size with a high degree of finish, i.e. smooth, on the tip and eyes.

In use, the part 2, or proximal part, is connected via the funnel to a connector such as the inlet tube of a urine collection device (not shown) while the tip 4 is inserted into a patient. The 10 catheter thus forms part of a urine drainage or collection system.

CLAIMS

1. A catheter, integrally formed in one piece in a single forming step.
2. A catheter according to Claim 1, the forming step comprising 5 injection moulding.
3. A catheter according to Claim 1 or Claim 2, the one piece comprising a tapered tubular portion leading to a cylindrical tubular portion bearing a tip.
4. A catheter according to Claim 3, the cylindrical tubular portion having a plurality of through holes in the wall thereof on opposite diametral sides of the portion.
5. A catheter according to Claim 4, the respective holes on opposite diametral sides of the portion being longitudinally offset.
- 15 6. A catheter according to any of Claims 3 to 5, the tip being open.
7. A catheter according to any of Claims 1 to 3, the tip being open and having portions of different diameter.
8. A catheter according to Claim 7, the tip being castellated or 20 stepped.
9. A catheter according to any of Claims 3 to 8, the wall thickness of the tapered tubular portion being greater than the wall thickness of the cylindrical tubular portion.

10. A catheter according to any of Claims 3 to 9, the wall thickness adjacent the tip being greater than the wall thickness of the cylindrical tubular portion and less than the wall thickness of the tapered cylindrical portion.
- 5 11. A catheter, substantially as hereinbefore described with reference to the accompanying drawing.
12. A urine drainage system, including a catheter according to any preceding Claim.